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10/583,463	06/19/2006	Yukihiro Kiuchi	W1878.0234	2531

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EXAMINER	
LOEWE, ROBERT S	
ART UNIT	PAPER NUMBER
1796	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,463	KIUCHI ET AL.	
	Examiner	Art Unit	
	ROBERT LOEWE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-8,12-14,16-18 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-8,12-14,16-18 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicants' arguments filed on 09/21/2009 have been fully considered.

The previously relied upon rejection of claims 1-4, 7, 8, 16 and 17 to Iwahashi (US 2003/0162011) in view of Yamada (JP 2003-192925 with US 2005/0143502 as English Language equivalent) has been withdrawn owing to Applicants amendments.

The previously relied upon rejection of claims 5, 9-11 and 19 (these claims now canceled) to Iwahashi (US 2003/0162011) in view of Yamada (JP 2003-192925 with US 2005/0143502 as English Language equivalent) has been withdrawn owing to Applicants amendments.

The prior art rejection of claims 1-4 and 8 to Yamada et al. is maintained in part. Specifically, Yamada et al. is relied upon in a single reference 103(a) rejection of claim 1 and newly added secondary references are brought in for the other dependent claims.

The prior art rejection of claims 6 and 12-14 to Yamada et al. in view of Shiping (US 2002/0099160) is maintained in part. Further, Yamada et al. in view of Shiping is also newly relied upon for instant claim 20 as well.

Regarding the 103(a) rejection of claims 1-5 and 8-11 to Yamada et al., Applicants argue that the Yamada reference does not disclose employing aluminum hydroxide flame retardants having a sodium oxide impurity level of less than 0.18%. The Examiner agrees with this allegation. However, the motivation to increase the purity level of the aluminum hydroxide flame retardant is rooted in the teachings of Yamada et al. Yamada teaches a purity level of 99.5% or more, this level encompasses all purity levels above 99.5%, including a purity levels of

99.82% and above. Moreover, purer forms of known products may be patentable, but the mere purity of a product, by itself, does not render the product unobvious. *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. Appl. & Inter. 1989). Applicants argue that a person having ordinary skill in the art would not be motivated to increase the aluminum hydroxide purity level such that it meets the instantly claimed impurity amount since such an undertaking would be expensive and difficult. The Examiner would like to point out that the prior art is filled with teachings on how to prepare aluminum hydroxide with sodium oxide impurity levels which satisfy the instant claim. See for example, (1) US 2003/0012728 to Kato et al. (paragraphs 0027-0034), (2) US Pat. 5,985,165 to Fukuta et al., (11:29-36), (3) US Pat. 5,096,762 to Yoshida et al. (3:57-4:25), (4) US Pat. 5,445,807 to Pearson (Example 3), (5) US 2002/0022127 to Katsuda et al. (paragraph 0024), and (6) US 2001/0036438 to Yamamoto (paragraph 0013). Therefore, it is not believed a person having ordinary skill would be hard-pressed at preparing or purifying the aluminum hydroxide taught by Yamada et al. such that it satisfies the impurity levels of the instant claims.

Applicants further argue that the flame-proofing compositions as claimed exhibit unexpected results. However, it is believed that the results shown by Applicants would indeed be expected based on what is already known in the prior art. Specifically, it is known that polylactic acid depolymerizes in the presence of alkali metals, such as sodium hydroxide, even under dilute concentrations [See, for example, (1) US Pat. 6,737,372 to Minami et al. (example 1), (2) US Pat. 6,114,496 to Otera et al. (7:44-54), (3) US Pat. 7,514,503 to Nakamichi (20:10-18), (4) US Pat. 5,593,778 to Kondo (1:28-33)]. Further, it is also well-known that sodium oxide readily reacts with water to produce sodium hydroxide [See, for example (1) US Pat. 6,639,031 to Poetsch et al. (10:1-26), (2) SIR H601 to Carlton et al. (8:59-65) and (3) US Pat. 6,919,061 to

Sherman et al. (4:24-37)]. Finally, US 2006/0194899 to Ohashi et al. explicitly teaches that sodium oxide reacts with water to promote hydrolysis of polylactic acid (paragraph 0017). Therefore, it would have been expected that reducing the level of sodium oxide content in the aluminum hydroxide fillers would increase the hydrolysis stability of the polylactic acid which would in turn improve the flame combustion time. As such, Applicants showing of unexpected results is believed to flow from what is already well-known in the prior art.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent).

Yamada et al. exemplifies a formulation comprising 48 wt% of polylactic acid and 50 wt% of aluminum hydroxide (Example 16, Table 5).

Though Yamada et al does not explicitly teach that the sodium oxide content present within the aluminum hydroxide is less than 0.18% by mass, Yamada et al. does explicitly teach that it is preferable to employ the flame retardant additive, including aluminum hydroxide, with purity levels of about 99.5% or more, because the shelf stability of the composition is improved when using the hydroxide compound having a higher purity. Yamada et al further teaches specific examples of impurities in the hydroxide compounds to include T-Na_20 and S-Na_20 [0045].

Since Yamada et al teaches a correlation between the impurity content of the hydroxide compounds and shelf stability, it would have been obvious to one of ordinary skill in the art to have used the aluminum hydroxide of example 16 of Yamada et al at various purity levels, including 99.82% or more so as to maintain good shelf stability.

Claim 7: Yamada et al. further teaches that carbon fibers may be added as a reinforcing filler. A person having ordinary skill in the art would have found it obvious to add such a filler in the amounts as claimed in order not to detract from the goal of preparing flame-proofing materials using the flame retardants and polymers taught by Yamada et al.

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) in view of Yamamoto et al. (US Pat. 6,184,312).

Yamada et al. exemplifies a formulation comprising 48 wt% of polylactic acid and 50 wt% of aluminum hydroxide (Example 16, Table 5).

Though Yamada et al does not explicitly teach that the sodium oxide content present within the aluminum hydroxide is less than 0.18% by mass, Yamada et al. does explicitly teach that it is preferable to employ the flame retardant additive, including aluminum hydroxide, with purity levels of about 99.5% or more, because the shelf stability of the composition is improved when using the hydroxide compound having a higher purity. Yamada et al further teaches specific examples of impurities in the hydroxide compounds to include T-Na_20 and S-Na_20 [0045].

Since Yamada et al teaches a correlation between the impurity content of the hydroxide compounds and shelf stability, it would have been obvious to one of ordinary skill in the art to have used the aluminum hydroxide of example 16 of Yamada et al at various purity levels, including 99.82% or more so as to maintain good shelf stability.

While Yamada et al. does not explicitly teach the addition of from 0.5 to 20 parts by mass of component (C) of instant claims 2 and 4, Yamamoto et al. explicitly teaches flame retardant resin compositions which are comprised of a thermoplastic resin and a minor amount (up to 10% by weight) of an organopolysiloxane containing phenyl and alkoxy radicals (abstract and 4:12-21). The amount Yamada et al. and Yamamoto et al. are combinable because they are from the same field of endeavor, namely, flame retardant organic polymer compositions. At the time of the invention, a person having ordinary skill in the art would have found it obvious to add the silicone resins as taught by Yamamoto et al. in the amounts required by instant claim 2 and would have been motivated to do so since Yamamoto et al. teaches that the addition of such polysiloxanes imparts flame retardance and drip inhibition without the use of halogenated flame retardants (3:6-16). It is believed that in the field of imparting flame retardancy, a person having

ordinary skill in the art is always trying to improve the flame retardancy of polymer compositions. So while the compositions of Yamada et al. are taught to be flame retardant, they are not flame proof. Therefore, it would have been obvious to a person having ordinary skill in the art to add the silicone resins taught by Yamada et al. in an effort to further improve the flame retardancy.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) in view of Yamamoto et al. (US Pat. 6,184,312).

Yamada et al. exemplifies a formulation comprising 48 wt% of polylactic acid and 50 wt% of aluminum hydroxide (Example 16, Table 5).

Though Yamada et al does not explicitly teach that the sodium oxide content present within the aluminum hydroxide is less than 0.18% by mass, Yamada et al. does explicitly teach that it is preferable to employ the flame retardant additive, including aluminum hydroxide, with purity levels of about 99.5% or more, because the shelf stability of the composition is improved when using the hydroxide compound having a higher purity. Yamada et al further teaches specific examples of impurities in the hydroxide compounds to include T-Na_20 and S-Na_20 [0045].

While Yamada et al. does not explicitly teach the addition of from 0.5 to 20 parts by mass of component (C) of instant claims 2 and 4, Yamamoto et al. explicitly teaches flame retardant resin compositions which are comprised of a thermoplastic resin and a minor amount (up to 10% by weight) of an organopolysiloxane containing phenyl and alkoxy radicals (abstract and 4:12-

21). The amount Yamada et al. and Yamamoto et al. are combinable because they are from the same field of endeavor, namely, flame retardant organic polymer compositions. At the time of the invention, a person having ordinary skill in the art would have found it obvious to add the silicone resins as taught by Yamamoto et al. in the amounts required by instant claim 2 and would have been motivated to do so since Yamamoto et al. teaches that the addition of such polysiloxanes imparts flame retardance and drip inhibition without the use of halogenated flame retardants (3:6-16). It is believed that in the field of imparting flame retardancy, a person having ordinary skill in the art is always trying to improve the flame retardancy of polymer compositions. So while the compositions of Yamada et al. are taught to be flame retardant, they are not flame proof. Therefore, it would have been obvious to a person having ordinary skill in the art to add the silicone resins taught by Yamada et al. in an effort to further improve the flame retardancy.

Regarding component (D), Yamada et al. teaches the addition of crystallization promoters, i.e., nucleating agents may be added to the composition, which include many of the same crystallization promoters as the instant specification (paragraph 0069). The amount of component (D) of the instant claim is quite broad, with the lower amount being 0.5 wt%. Given the overall teachings of Yamada et al., it would have been obvious to employ such crystallization promoters in minor amounts so as not to detract away from the goal of preparing flame retardant biodegradable formulations of Yamada et al.

Claims 6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) in view of Shiping (US 2002/0099160).

Yamada et al teaches all the claim limitations as set forth above and further teaches the flame-retardant thermoplastic resin composition further comprising reinforcement, examples of which include Teflon [0059]. Teflon is a registered trademark for polytetrafluoroethylene.

Though modified Yamada et al does not teach the flame-retardant thermoplastic composition further comprising (E) in a weight proportion of the instant claim, Yamada et al further teaches that additives, including Teflon (polytetrafluoroethylene) can be added to the thermoplastic resin composition in an amount such that the desired effect of the composition of the invention is not sacrificed [0058, lines 1-4].

Yamada et al. does not explicitly teach that the reinforcement agent, which includes PTFE, may be added in amounts of less than 1 wt%. However, Shiping teaches flame retardant resin compositions comprising polycarbonate resins (abstract). Shiping further teaches the composition of the invention further comprises an anti-drip agent (D) and further teaches that an anti-drip serves to inhibit dripping during burning [0134-0138]. Shipping further exemplifies a composition comprising 0.5 weight parts PTFE per 100 parts of the thermoplastic resin [see Example 1, 0173]. Yamada et al. and Shiping are combinable because they are from the same field of endeavor, namely, flame retardant resin compositions and molded products thereof. At the time of the invention, a person having ordinary skill in the art would have found it obvious to have employed the PTFE resins as taught by Yamada et al. in the amounts exemplified by

Shiping since such amounts afford flame retardant compositions with good flame proofing (V-0 and V-1 rated) compositions which further have anti-drip properties.

Claim 20: Yamada et al. further teaches that carbon fibers may be added as a reinforcing filler. A person having ordinary skill in the art would have found it obvious to add such a filler in the amounts as claimed in order not to detract from the goal of preparing flame-proofing materials using the flame retardants and polymers taught by Yamada et al.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 2003-192925, see US 2005/0143502 for English Language equivalent) in view of Yamamoto et al. (US Pat. 6,184,312) as applied to claims 2-4, respectively, further in view of Shiping (US 2002/0099160).

Claims 6 and 12-14: Yamada et al. in view of Yamamoto et al. collectively render obvious the limitations of instant claims 2-4, as described above. Yamada et al. further teaches that the flame-retardant thermoplastic resin compositions may further comprise the addition of reinforcing fillers such as Teflon [0059]. Teflon is a registered trademark for polytetrafluoroethylene.

While Yamada et al. does not explicitly teach that the reinforcement agent, which includes PTFE, may be added in amounts of less than 1 wt%, the addition of such a component in the claimed amounts is believed to be obvious to a person having ordinary skill in the art in view of Shiping. Shiping teaches flame retardant resin compositions comprising polycarbonate resins (abstract). Shiping further teaches the composition of the invention further comprises an anti-drip agent (D) and further teaches that an anti-drip serves to inhibit dripping during burning

[0134-0138]. Shipping further exemplifies a composition comprising 0.5 weight parts PTFE per 100 parts of the thermoplastic resin [see Example 1, 0173]. Yamada et al. and Shiping are combinable because they are from the same field of endeavor, namely, flame retardant resin compositions and molded products thereof. At the time of the invention, a person having ordinary skill in the art would have found it obvious to have employed the PTFE resins as taught by Yamada et al. in the amounts exemplified by Shiping since such amounts afford flame retardant compositions with good flame proofing (V-0 and V-1 rated) compositions which further have anti-drip properties.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT LOEWE whose telephone number is (571)270-3298. The examiner can normally be reached on Monday through Friday from 5:30 AM to 3:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. L./
Examiner, Art Unit 1796
16-Jan-10

/RANDY GULAKOWSKI/
Supervisory Patent Examiner, Art Unit 1796